Young: Note on functions of upper and lower type.—Mrs. G. C. **Young**: The derivates of a function.

MANCHESTER.

Literary and Philosophical Society, March 21.—Prof. S. J. Hickson, president, in the chair.—Prof. F. E. **Weiss**: Recent views concerning the nature of so-called "graft hybrids." The author gave an account of the recent researches made on graft hybrids, describing, among others, the curious form of *Cytisus Adami*, obtained early last century by grafting the purple Cytisus on the yellow Laburnum, and the more recent productions resulting from grafting shoots of the tomato upon young plants of the nightshade. In this, as in the purple Laburnum, reversions to both parental forms are common. Other cases of so-called hybrids are known between the hawthorn and medlar, the quince and pear, and the almond and peach. A summary was given of the various views put forward to account for the production of these curious intermediate forms, and the relationship of the graft hybrids to ordinary seed hybrids was discussed.

April 4.—Prof. S. J. Hickson, president, in the chair.—Prof. G. Elliot **Smith**: The origin of the cerebral cortex. The cerebral cortex was called into existence during the process of evolution of the vertebrates, and, though difficult to detect in certain fishes, is to be regarded as a distinctive and inherent feature of vertebrate structure. The microscopic *formatio pallialis* of the Cyclostomes represents the undifferentiated rudiment of the whole of the pallium (hippocampal formation, piriform area, and neopallium of the highest vertebrates), and not merely the hippocampus. The cerebellum grew up around the central terminations of the nerves which bring into the nervous system special information concerning the animal's position in space; and its cortical mechanism developed in response to the need for bringing this information under the control of other influences, such as the nerves of vision, touch, the muscular sense, etc., before it is transmitted to the muscles of the body as a whole. The cerebral cortex grew up in a similar way around the central terminations of the olfactory nerve.—Prof. G. Elliot **Smith**: The commencement of the Neolithic phase of culture. Evidence pointed to the introducers of the Azilian culture as representing an early wave of the Neolithic people, coming probably from Africa into Europe. The author suggested that sporadic bearers of the same culture probably made their way into Europe for many centuries before the close of the Palæolithic epoch there. This would explain many similarities of Magdalenian to Azilian implements, and of both to those of Predynastic Egypt.—J. W. **Jackson**: The geographical distribution of the use of pearls and pearl-shells. The special appreciation of pearls is intimately associated with the geographical distribution of elements of a culture, including, amongst other things, the use of shell-purple for dyeing and of conch-shells for trumpets. Through Phœnician trade the knowledge of the pearl spread from the eastern Mediterranean *viâ* the Red Sea and Persian Gulf to India and Ceylon, China and Japan, Indonesia and the Pacific Islands, and, finally, the New World.—J. W. **Jackson**: The use of shells for the purposes of currency. No form of shell-money has been used so extensively as the money-cowry, *Cypraea moneta*, and this is used in a natural state. The date of the introduction of this cowry-currency is unknown, but it was in use in Egypt in Predynastic times. Shell-currency has been recorded from the Sandwich Islands, New Hebrides, and New Caledonia, and it was extensively used in China and on the Pacific coast of North America. Portuguese voyagers refer to its use in West Africa in the fifteenth century, and it is at present in vogue in tropical Africa.

PARIS.

Academy of Sciences, April 25.—M. Camille Jordan in the chair.—The president announced the death of M. Emile Jungfleisch, member of the Academy.—G. **Bigourdan**: Monthly distribution of average cloudiness in France. A discussion of observations from thirty-five stations in France and foreign stations close to the French frontier. In the scale adopted 0 indicates blue sky, and 10 a completely clouded sky, and the results are shown in thirteen charts, one for each month, and one for the yearly average, giving the isonephs, or lines of equal cloudiness. More observation stations are required before full conclusions can be drawn.—T. **Levi-Civita**: The regularisation of the problem of three bodies.—W. **Sierpinski**: A cantorian curve which contains a biunivocal and continuous image of any given curve.—E. **Baticle**: Calculation of the thrust on a supporting wall by a powdery mass with free plane surface.—Gabriel **Sizes**: Properties of the law of resonance of vibrating bodies.—J. **Deprat**: The structure of the internal zone of the preyunnan sheets.—Emile **Belot**: Contribution to the study of the causes of volcanoes. An experiment showing the production of a miniature crater by the action of locally applied heat to a mixture of water and sand, showing why the vapour is evolved at a considerable distance from the source of heat. Assuming a connection between volcanoes and the influx of sea-water, this explanation removes the difficulty of the South American volcanoes situated a considerable distance from the sea.—E. **Mathias**: Three observations of globular lightning made at the summit of the Puy de Dome.—F. **Jadin** and A. **Astruc**: The manganese in some springs connected with the central massif and some stations in the plain of Languedoc. The amounts of manganese found vary between 0·001 and 0·4 mgr. per litre. The data confirm the conclusions given in previous communications on the amounts of manganese in French mineral waters.—Henry W. **Brolemann**: An evolutive process in Diplopod Myriapods.—E. **Kayser**: Contribution to the study of the ferments of rum. A study of the fermentation products produced from beetroot, molasses, and cane-sugar molasses by various yeasts. Figures are given for the higher alcohols, volatile acids, aldehydes, and ethers.—F. **Garrigou**: The hygienic, rational, and economical treatment of human excreta.—M. **Marage**: True and simulated deaf-mutism resulting from wounds received in battle. The medical examination of such cases should avoid experiments causing pain to the patient, and in the case of a painful treatment, involving possibly negative results, the consent of the patient should always be obtained.—H. **Busquet**: The rapid immunisation by small doses of nucleinate of soda, or chaulmoogra oil, against the hypotensive action of large doses of these substances.

BOOKS RECEIVED.

Statics: A First Course. By C. O. Tuckey and W. A. Nayler. Pp. 299. (Oxford: Clarendon Press.) 3*s*. 6*d*.

Historical Introduction to Mathematical Literature. By Prof. G. A. Miller. Pp. xiii+302. (London: Macmillan and Co., Ltd.) 7*s*. net.

The Principles of Agronomy. By Prof. F. S. Harris and G. Stewart. Pp. xvi+451. (London: Macmillan and Co., Ltd.) 6*s*. net.

The Influence of Ancient Egyptian Civilization in the East and in America. By Prof. G. Elliot Smith. Pp. 32. (Manchester: University Press; London: Longmans and Co.) 1*s*. net.

Annual Report of the Director, Kodaikanal and Madras Observatories for 1915. Pp. 24. (Madras: Government Press.)

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An Intermediate Text Book of Magnetism and Electricity. By G. F. Woodhouse. Pp. x+264. (Sedbergh: Jackson and Son.) 6*s.* net.

Canada. Department of Mines. Preliminary Report on the Mineral Production of Canada during the Calendar Year 1915. Nos. 348, 349, 350, 383, 408. (Ottawa: Government Printing Bureau.)

Spitsbergen Waters. Oceanographic Observations during the Cruise of the *Veslemoy* to Spitsbergen in 1912. By F. Nansen. Pp. 132. (Christiania: J. Dybwad.)

Proceedings of the Geological Society of South Africa. To accompany vol. xviii. of the Transactions. January-December, 1915. Transactions of the Geological Society of South Africa. Vol. xviii. Pp. 134+plates xvi. (Johannesburg.)

The Purpose of Education. By St. George Lane Fox Pitt. New edition. Pp. xxviii+144. (Cambridge: At the University Press.) 2*s.* 6*d.* net.

The Value of Science in the Smithy and Forge. By W. H. Cathcart. Pp. xiv+163. (London: C. Griffin and Co., Ltd.) 4*s.* net.

A Guerra E. O. Pensamento Medico. By Prof. R. Jorge. Pp. 63. (Lisboa: Sociedade das Sciencias Medicas.)

Department of Commerce. Scientific Papers of the Bureau of Standards. No. 274. (Washington: Government Printing Office.)

Imperial Department of Agriculture for the West Indies. Sugar-Cane Experiments in the Leeward Islands. Report on Experiments conducted in Antigua and St. Kitts in the Season 1914–15. Parts i. and ii. Pp. 76. (Barbados.)

Yorkshire's Contribution to Science, with a Bibliography of Natural History Publications. By T. Sheppard. Pp. 233. (London: A. Brown and Sons, Ltd.) 5*s.* net.

Cassell's Modern School Series. Historical Section. The Tale of Ancient Peoples. By A. E. McKilliam. Pp. 128. The Tale of the Nations. By A. E. McKilliam. Pp. 160. (London: Cassell and Co., Ltd.) 10*d.* net and 1*s.* net respectively.

The Practical Principles of Plain Photo-Micrography. By G. West. Pp. xii+145+plates viii. (Dundee: The Author, University College.) 4*s.* 6*d.* net.

Annuario publicado pelo Observatorio Nacional do Rio de Janeiro, 1916. Anno xxxii. Pp. vi+259. (Rio de Janeiro.)

DIARY OF SOCIETIES.

THURSDAY, May 11.

Royal Society, at 4.30.—Seventh Memoir on the Partition of Numbers. A Detailed Study of the Enumeration of the Partitions of Multipartite Numbers: Major P. A. MacMahon.—Legendre's Functions $P_n (\theta)$ when n is Great and θ has any Value: Lord Rayleigh.—The Occurrence of Gelatinous Spicules and their Mode of Origin in a New Genus of Siliceous Sponges: Prof. A. Dendy—The Classification of the Reptilia: E. S. Goodrich.—The Experimental Production of Congenital Goitre: Dr. R. McCarrison.

Royal Institution, at 3.—Flints and Flint Implements: Sir Ray Lankester.

Institution of Electrical Engineers, at 8.—Annual General Meeting.

Institution of Mining and Metallurgy, at 5.30.—*Discussion:* The Influence of the War on the Mining and Metallurgical Industries.

FRIDAY, May 12.

Royal Astronomical Society, at 5.—The Surface Currents of Jupiter in 1915–16: S. Bolton.—Observations of V Cassiopeiæ in 1910–16: A. N. Brown.—The Certainty of the Canals of Mars: G. H. Hamilton.—The Illumination of the Field of a Photographic Objective: H. C. Lord.—The Law of Distribution in Star-clusters: J. H. Jeans.—The Efficiency of Sun Spots in Relation to the Mean Daily Range of Terrestrial Magnetic Declination: Rev. A. L. Cortie.—The Theory of Star-streaming and the Structure of the Universe. II: J. H. Jeans.—The Distribution of Stars in Globular Clusters: A. S. Eddington.—Stars with Large Proper Motion between Declination 65° and the North Pole: Royal Observatory, Greenwich.—Solar Prominence in 1915: G. J. Newbegin.

Physical Society, at 5.—The Latent Heats of Fusion of Metals and the Quantum Theory: Dr. H S. Allen.—(1) Lenses for Light Distribution; (2) The Choice of Glass for Cemented Objectives: T. Smith.

Malacological Society, at 7.—Descriptions of New Mollusca: G. B. Sowerby.—Solander as a Conchologist: T. Iredale—Misnamed Tasmanian Chitons: T. Iredale and W. L. May.

SATURDAY, May 13.

Royal Institution, at 3.—X-Rays and Crystals: Prof. W. H. Bragg.

MONDAY, May 15.

Aristotelian Society, at 8.—Symposium at Oxford—The Theory of the State: Hon. B. Russell, S. Ball, C. D. Burns, and G. D. H. Cole.

Royal Society of Arts, at 4.30.—Vibrations, Waves, and Resonance: Dr. J. Erskine-Murray.

TUESDAY, May 16.

Royal Institution, at 3.—Unconscious Nerves—their Functions in Internal Life: Prof. C. S. Sherrington

Royal Statistical Society, at 5.15.

Institution of Petroleum Technologists, at 8.—Petroleum Refining: A. Campbell.

WEDNESDAY, May 17.

Royal Meteorological Society, at 4.30.—The Re-adjustment of Pressure Differences—Two Species of Atmospheric Circulation and their Connection: L. C. W. Bonacina.

Royal Microscopical Society, at 8.—Some Suggestions regarding Visual Efficiency in the Use of the Microscope and other Optical Instruments: J. W. Purkiss.—A Case of Apparent Intelligence exhibited by a Marine Tube-bearing Worm, *Terebella conchilega*: A. T. Watson.—Alien Oligochæts in England: Rev. Hilderic Friend.

Royal Society of Arts, at 4.30.—Hindu Hand-painted Calicoes of the Seventeenth and Eighteenth Centuries, and their Influence on the Tinctorial Arts of Europe: G. P. Baker.

THURSDAY, May 18.

Royal Society, at 4.30.

Royal Institution, at 3.—Flints and Flint Implements: Sir Ray Lankester.

FRIDAY, May 19.

Royal Institution, at 5.30.—The Movements of the Earth's Pole: Col. E. H. Hills.

Institution of Mechanical Engineers, at 6.—Spur-Gearing: D. Adamson.

SATURDAY, May 20.

Royal Institution, at 3.—The Finance of the Great War—New Problem and New Solutions: Prof. H. S. Foxwell.

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